Photoionization Study of the Iron Isonuclear Sequence

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Photoionization of Fe^{3+}, Fe^{5+}, and Fe^{7+} ions was studied using the ion-photon beam endstation on beamline 10.0.1 at the Advanced Light Source, where ion beams from an ECR source were merged with monochromatic beams of synchrotron radiation. The photoion-yield spectra contain numerous resonances due to photoexcitation of autoionizing states, including extremely broad features in Fe^{3+} and Fe^{5+} that are thought to result from fast super-Coster-Kronig transitions following 3p-3d excitations. Absolute photoionization cross section measurements were also performed for these ions using beams with unknown fractions of ground and metastable states. Comparison with theoretical calculations will be presented.